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RISK ASSESSMENT FOR ASBESTOS IN SOIL

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ABSTRACT

On behalf of the City of Sarnia (the City), Golder Associates Ltd. completed a risk assessment to evaluate potential risks to human health and ecological receptors associated with soil and groundwater contamination at a multi-use recreational municipal park located on the City's harbour front. Soil and groundwater investigations completed at the site revealed elevated concentrations of a number of typical industrial contaminants (including metals, volatile organic compounds, petroleum hydrocarbons and polynuclear aromatic hydrocarbon) relative to generic regulatory standards. Options for the management/remediation of these impacts were complicated by the observed presence of asbestos in soil at the site and the absence of an established regulatory criteria or framework for assessing risks associated with this contaminant. Based on these environmental conditions, the City, in consultation with the Ministry of the Environment (MOE) and the local Medical Officer of Health (MOH) closed the park to public use and access.

In order to establish the necessary conditions to allow the park to be rehabilitated for safe public use, a risk assessment was undertaken in general accordance with the methods prescribed under Ontario Regulation 153/04, as amended, and the resulting recommended risk management measures were implemented. As part of the risk assessment process, a review of approaches for the assessment and management of asbestos in soil in other jurisdictions was completed. The results of the review indicated that most jurisdictions have guidelines established for asbestos concentrations in air, but guidelines are not readily available for asbestos in soil. Furthermore, the relationship between the concentration of asbestos in soil and asbestos fibres in air was determined to be complex, dependent on a high number of variables and difficult to predict. For this reason, any detection of asbestos in soil (including "trace") was retained for further consideration in the risk assessment.

The risk assessment completed for the park was considered a "new science" risk assessment due to the absence of any generic site condition standards for asbestos in soil. Risks to human health associated with asbestos were evaluated qualitatively. The risk assessment considered two scenarios: parkland use and construction, in order to accommodate both site remediation/redevelopment and eventual reuse by the public

The results of the risk identified the need to incorporate both temporary and long term risk management measures to protect the public and workers at the site. The temporary measures included: maintenance of a temporary fence around the perimeter of the site to block access for human receptors during site remediation and construction activities; the implementation of an air monitoring program to mitigate inhalation pathways during soil disturbing activities; and use of personal protective equipment (PPE) by outdoor workers on the site during remediation and construction to block direct contact pathways. The long-term (post construction) risk management measures included the installation of a hard cap, shallow cap or fill cap at the site along with the removal of soil in specific areas to unimpacted levels (as defined in the risk assessment) to block all direct contact pathways and the inhalation of asbestos fibres. The soil containing asbestos was managed by placement in berms capped to prevent exposure.

The first phase of the remediation was completed in late 2014 and a portion of the park was re-opened to the public in 2015 following seeding of the remediated area. The remainder of the remediation is planned for 2016. The success of the project. The success of the project was indebted to the consultative process involving the City, the MOE, the MOH and the public which facilitated robust consideration and review of technical approaches and aided in building consensus around the selected approach for management of impacts on the site.

Keywords: Asbestos, Risk Assessment